

(19)



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) Publication number:

0 470 696 A1

(12)

EUROPEAN PATENT APPLICATION

(21) Application number: 91305798.0

(51) Int. Cl.⁵: F16B 5/02

(22) Date of filing: 26.06.91

(30) Priority: 06.08.90 DE 9011441 U

(43) Date of publication of application:
12.02.92 Bulletin 92/07

(84) Designated Contracting States:
DE ES FR GB IT

(71) Applicant: EMHART INC.
Drummond Plaza Office Park, 1423, Kirkwood
Highway
Newark, Delaware 19711(US)

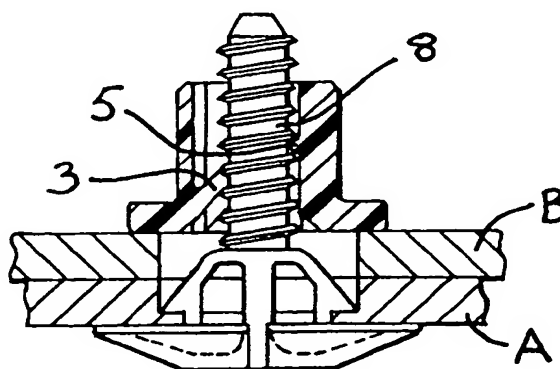
(72) Inventor: Schäty, Harald
Neuer Weg 4
W-6330 Wetzlar 17(DE)

(74) Representative: Wetters, Basil David Peter
Emhart Patents Department, Lyn House, 39,
The Parade
Oadby, Leicester LE2 5BB(GB)

(54) Device for fastening two components.

(57) A device for fastening two components (A, B) to one another by means of a threaded stud (8) attached to one component and passing through a hole in the second component arranged so that a tubular body is formed so that it can first be located on the stud (8) by pressing and then secured by turning to engage the threaded stud.

FIG. 3



The invention relates to a device for fastening two components to one another, one of which has the form of a plate to which a threaded stud is attached which can pass through the second component and onto which stud a tubular body can be screwed after the two components have been positioned together.

It is known with such devices to use plastics nuts which are provided, in the region of the end turned toward the components to be fixed to one another, with resilient tongues which serve to transmit torque onto the stud and which are inclined inwardly against the screw-tightening direction. With this known arrangement, however, there is a great danger that the flexible tongues cannot be screwed any further onto the stud, particularly if the two components to be joined together already lie on one another, because these tongues yield and can also damage the thread.

Accordingly, it is an object of the present invention to construct a device of the type outlined in the above, such that a tubular body adapted to cooperate with the stud, even after secure tightening, that is after the two components which are to be joined together come into contact, can reliably transmit torque to the stud and therefore provide a very secure hold, the resilient tongues merely having a positioning function.

According to the invention, this object is achieved in that the tubular body has, in addition to resilient tongues on its internal wall, which are spaced apart round the periphery in the region of its end portion facing the component and engage the thread of the stud, at least three cam-like projections which are axially spaced from the tongues and are integral with the tubular body, their external contours corresponding to the thread depth of the stud and the projections engaging in the stud.

The fastener of the present invention has the advantage, on the one hand, that the stud does not necessarily have to be welded to a plate, but can also be pushed as a plastics body from below through the plate and then through a hole in the component to be fixed to the plate, whereupon the tubular body can simply be pressed onto the free end of the stud. The resilient tongues slide past the first screw threads and hold the tubular body in its starting position. A spanner, for example, can then be applied to the tubular body to screw the tubular body downwards until it makes contact, the cam-shaped projections engaging in the screw thread or threads and taking over the actual transmission of the torque in this case. As these projections are solid in construction and are provided on the internal wall of the tubular body so that they do not yield, there is a guarantee that they always engage with the thread of the stud and the two components

are therefore pressed securely together. As the entire tubular body can be produced in one piece by injection moulding, no excessively expensive apparatus is required for producing it.

A preferred embodiment of the invention will now be described in greater detail by way of example with reference to the accompanying drawings, in which:-

Figure 1 shows a plan view of the tubular body,

Figure 2 shows a sectional view along the line II-II of Figure 1, and

Figure 3 shows a sectional view through an arrangement in which the tubular body rests on a stud and two components are fixed on one another.

The tubular body 1 (Figure 2) serves, together with a stud 8, to fasten together the two adjacent components A, B. The stud can be welded on the plate-shaped substrate A or can extend through an orifice, the other component B to be secured on this substrate A being pushed over the stud 8 until it rests on the substrate B. The tubular body 1 is then pushed onto the stud which extends through the central orifice in the body 1, as indicated in Figure 1, flexible tongues 3 being provided at the lower end portion of the internal wall of the tubular body 1. In the arrangement described, these tongues serve as means for the pre-positioning of the tubular body 1 on the stud, the tubular body 1 being pushed peripherally on the stud so that the resilient tongues yield and can slide over the individual screw threads of the stud. When no further pressure is exerted on the tubular body 1 in the direction of the components to be secured to one another, the tongues 3 engage in the external thread of the stud.

Webs 4, on whose end faces cam-like projections 5 are constructed, are also provided on the internal wall 2 of the tubular body, as shown in Figure 1. These projections 5 are peripheral and do not lie in a plane so they can engage in the screw threads of the stud. After the above-mentioned pre-positioning, a tool can be applied to the external periphery of the tubular body 1, which is hexagonal in the preferred embodiment, and the tubular body can be screwed onto the stud until the components A, B to be fixed on one another can be held in their final position. In this position, the tongues 3 cannot be used to transmit the torque because they escape from the screw threads of the stud owing to their flexibility and therefore lose their original screwing action. The projections 5, which then transmit the torque alone, are hemispherical in the embodiment illustrated, but they can also have any other cross-sectional profile providing that they effectively engage in the thread of the stud such, for example, as a truncated cone, optionally with a curved, internal edge. The webs 4 on which the

projections 5 are provided are peripherally spaced from one another, are constructed between respectively adjacent tongues 3 and serve not only as reinforcement but also for effective engagement between the tubular body 1 and the stud 8 so that the components A, B to be fastened, of which, for example, the lower component A can be the body sheet of a motor vehicle while the other component B to be secured there can be a mounting for electric cables and the like, are rigidly joined together. The resilient tongues 3 inclined against the screwing-on direction of the tubular body 1 and also the projections 4 are arranged on the internal wall of the tubular body 1 such that the tongues can initially engage in the thread of the stud while the projections 5 are permanently located in the thread.

In the embodiment illustrated, the tubular body 1 is constructed integrally with the above-mentioned other components and is composed of a suitable plastics material, for example POM.

Figure 3 shows the arrangement when assembled. The stud, on which the tubular body 1 is screwed sufficiently far for the two components A, B to rest completely on one another, is pushed from below through a hole in the body sheet A and through another hole aligned therewith in component B.

More than one row of projections 5 may be provided, the rows being axially and radially spaced from one another.

Variations from the described embodiment can obviously be made without departing from the scope of the present invention.

Claims

1. Device for fastening two components to one another, one of which has the form of a plate to which a threaded stud is detached which can pass through the other component and onto which stud a tubular body can be screwed after the two components have been positioned together, characterised in that, the tubular body (1) has, in addition to resilient tongues (3) on its internal wall (2) which are spaced apart round the periphery in the region of its end portion (7) facing the component and engage the thread of the stud, at least three cam-like projections (5) which are axially spaced from the tongues (3) and are integral with the tubular body (1), their external contours corresponding to the thread depth of the stud and the projections (5) engaging in the thread.
2. Device according to claim 1, wherein the solidly constructed projections (5) are arranged on the internal wall (2) of the tubular body (1), are carried by webs (4) projecting inwardly from the internal wall and project inwardly from the webs (4), and in that the webs (4) are arranged with peripheral spacing from the resilient tongues (3) adjacent to them.
3. Device according to claim 1 or 2, wherein the internal edges of the webs (4) lie in a circle of which the diameter is somewhat greater than that of the circle defined by the internal edges of the tongues (3).
4. Device according to any one of the preceding claims, wherein each projection (5) has the form of a hemisphere.
5. Device according to any one of claims 1 to 3, wherein each projection (5) is in the form of a truncated cone with a curved internal edge.
6. Device according to any one of claims 2 to 5, wherein the webs (4) extend over the entire axial height of the tubular body (1) and in that the projections (5) on the webs (4) are arranged similarly to the pitch line of the thread of the stud.
7. Device according to claim 1, wherein more than one row of projections (5) is provided the rows being axially and radially spaced from one another.
8. Device according to any one of the preceding claims, wherein the tubular body (1), the tongues (3), the projections (5) and the webs (4) are constructed integrally with one another and are composed of plastics material.

FIG. 1

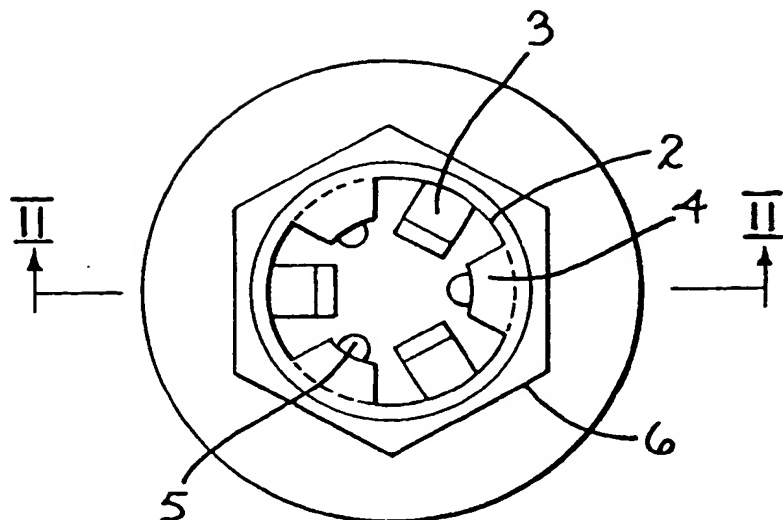


FIG. 2

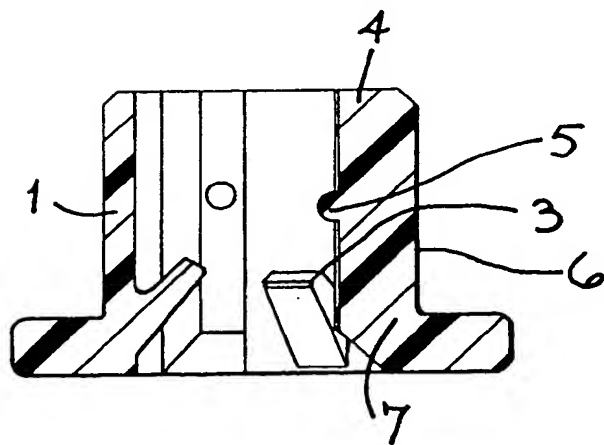
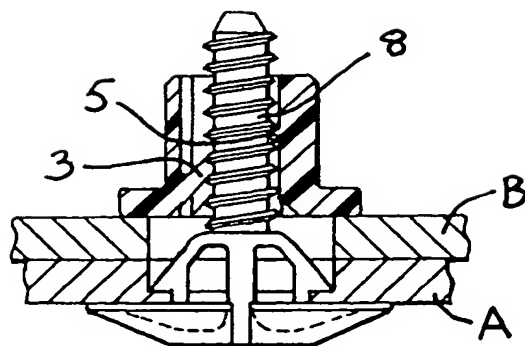


FIG. 3





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number

EP 91305798.0

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	DE - A1 - 2 842 986 (HOOKER CHEMICALS & PLASTICS CORP.) * Fig. *	1, 8	F 16 B 5/02
A	GB - A - 2 088 508 (MICRODOT INC.) * Abstract *	1	
A	DE - A1 - 3 728 070 (NIFCO INC.) * Fig. 5 *	1, 2, 8	
A	GB - A - 2 179 113 (TWR UNITED-CARR) * Abstract *	1, 2, 8	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			F 16 B 2/00 F 16 B 5/00 F 16 B 29/00 F 16 B 37/00 F 16 B 39/00
The present search report has been drawn up for all claims			
Place of search VIENNA		Date of completion of the search 09-10-1991	Examiner RIEMANN
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			
T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			